

Abstract of the Disclosure

Disclosed is a method for electromanipulation of at least one cell or cell-like structure having cell-like membranes, comprising the following consecutive steps: (a) at least one cell or cell-like structure is transported from one or more sample containers located on a chip through at least one microchannel located on said chip into a chamber located on said chip, wherein said chamber contains at least one electrode connected to a voltage generator, and wherein said microchannel provides a fluid contact between the sample containers, (b) either said at least one cell or cell-like structure is placed or aligned close to said at least one electrode, or said at least one electrode is placed or aligned close to said at least one cell or cell-like structure in said chamber, and (c) an electrical field is applied and focused on said at least one cell or cell-like structures, said electrical field being of a strength sufficient to obtain pore-formation in said at least one cell or cell-like structure or sufficient to obtain fusion of said at least one cell or cell-like structure with another cell or cell-like structures present in said chamber. The steps may be repeated until a desired number of fusion partners have been fused together. Also an apparatus for electromanipulation of at least one cell or cell-like structure having cell-like membranes is disclosed. Said apparatus comprises one or more sample containers for said cell or cell-like structure in fluid contact through at least one microchannel with a fusion chamber, optical trapping means for transport of individual cells or cell-like structures through said at least one microchannel into the fusion chamber, and at least one microelectrode connected to a voltage generator for providing a focused electrical field in the fusion chamber, wherein said sample container, said microchannel and said fusion chamber are placed on a chip.